

CREOSOTES

CAS Registry Numbers:

Creosote, Coal Tar: 8001-58-9

Creosote, Wood: 8021-39-4

Coal tar creosote is a black to brown oily liquid with an aromatic, characteristic odor. It is a distillate of coal tar and is produced by high temperature carbonization of bituminous coal. It is heavier than water (Merck, 1989). It is miscible with alcohol, ether, fixed or volatile oils, glycerin, and in solutions of fixed alkali hydroxides (HSDB, 1993). Coal tar creosote is soluble in dimethyl sulfate and practically insoluble in water. Its constituents are liquid and solid aromatic hydrocarbons, tar acids, and tar bases (Merck, 1989).

Wood creosote is obtained from wood tars by distillation and is composed mainly of guaiacol and creosol. It is an almost colorless or yellowish, highly refractive, oily liquid that has a characteristic, smoky odor and a caustic, burning taste. It is soluble in water, glycerol, glacial acetic acid, and fixed alkali hydroxide solutions. It is miscible with alcohol, chloroform, ether, and oils (Merck, 1989).

Physical Properties of Creosotes

Synonyms: Creosote, Coal Tar: brick oil; coal tar oil; creosote; creosote oil; cresylic creosote; heavy oil; liquid pitch oil; naphthalene oil; tar oil; wash oil; creosotum
Creosote, Wood: wood creosote; beachwood; creosote

	<u>Creosote, Coal Tar</u>	<u>Creosote, Wood</u>
Boiling Point:	194 - 400 °C	203 °C
Flash Point:	75 °C (165 °F)	
Density:	1.07 - 1.08	1.07 - 1.08
Specific Gravity:	1.06 at 38/15.5 °C	> 1.076 at 25 °C
Log Octanol/Water Partition Coefficient:	1.0	

(HSDB, 1993)

SOURCES AND EMISSIONS

A. Sources

Coal tar creosote is primarily used as a preservative of wood used in railroad ties, poles, fence posts, marine pilings, and other outdoor applications. It is also a constituent of fuel oil and is used as a lubricant for die molds, as a waterproofing agent, an animal dip, and in the

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manufacture of chemicals (HSDB, 1993).

Wood creosote is used as a lubricant for die molds, a waterproofing agent, and in the manufacture of chemicals. It is also used as an external antiseptic, disinfectant, an antipyretic, a styptic, an astringent, an expectorant, and as a local anesthetic in dentistry (HSDB, 1993).

Creosote is registered as a fungicide, insecticide, and repellent. It is used as a wood preservative to prevent fungal and insect damage to wood products. It is also applied as a paint or as a pressure treatment (DPR, 1996).

The licensing and regulation of pesticides for sale and use in California is the responsibility of the Department of Pesticide Regulation (DPR). Information presented in this fact sheet regarding the permitted pesticidal uses of creosote has been collected from pesticide labels registered for use in California and from DPR's pesticide databases. This information reflects pesticide use and permitted uses in California as of October 15, 1996. For further information regarding the pesticidal uses of this compound, please contact the Pesticide Registration Branch of DPR (DPR, 1996).

The primary stationary sources that have reported emissions of creosotes in California are lumber and wood products manufacturers, and crude petroleum and natural gas extraction (ARB, 1997b).

B. Emissions

The total emissions of creosotes from stationary sources in California are estimated to be at least 60,000 pounds per year, based on data reported under the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of creosotes was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of creosotes.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of creosotes was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

No information about the atmospheric persistence of creosotes was found in the readily-available literature.

AB 2588 RISK ASSESSMENT INFORMATION

The Office of Environmental Health Hazard Assessment reviews risk assessments submitted under the Air Toxics “Hot Spots” Program (AB 2588). Of the risk assessments reviewed as of April 1996, creosotes contributed to the total cancer risk in 2 of the approximately 550 risk assessments reporting a total cancer risk equal to or greater than 1 in 1 million (OEHHA 1996a). For non-cancer health effects, creosotes did not contribute to a total hazard index in any of the risk assessments reporting a total chronic or acute hazard index greater than 1 (OEHHA, 1996b).

HEALTH EFFECTS

Probable routes of human exposure to creosote are inhalation, ingestion, and dermal contact.

Non-Cancer: Creosote fumes and vapors can cause eye and respiratory tract irritation (Olson, 1994). Direct skin exposure to creosote can result in dermal photosensitization. Skin contact can lead to intense burning and itching with local erythema and may lead to pigmentation and chemical acne. Eye contact may result in keratitis and corneal scarring. The acute effects may be due to the phenolic and cresolic derivatives (Clayton and Clayton, 1981).

Cancer: Skin and lung tumors occur in mice exposed dermally to creosote mixtures. Creosote and creosote vapors are mutagenic in bacteria (IARC, 1985). The chemicals in the creosote mixtures that are responsible for tumorigenicity and mutagenicity are probably the polycyclic aromatic hydrocarbons. The United States Environmental Protection Agency has classified creosote as Group B1: Probable human carcinogen (U.S. EPA, 1995a). The International Agency for Research on Cancer has classified creosote as Group 2A: Probable human carcinogen, based on limited data in humans and sufficient data in experimental animals (IARC, 1987a).

The State of California has determined under Proposition 65 that creosotes are carcinogens (CCR, 1996). A preliminary cancer unit risk value for use in cancer risk assessments has been estimated as 1.7×10^{-3} (microgram per cubic meter)⁻¹, based on benzo(a)pyrene, although one or more additional components may be involved. In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of creosote is estimated to be no greater than 1,700 in 1 million (CAPCOA, 1993).

